

WHAT IS CLAIMED IS:

1 1. A reconfigurable filter comprising:
2 a plurality of elements including a configurable element and configured to
3 provide a filter circuit, the configurable element including at least two filter components and a
4 switch configured to selectively couple one of the at least two filter components to the filter
5 circuit; and

6 a switch control module configured to generate a switch control signal to control
7 the switch in the configurable element to selectively switch between two filter components, a
8 value of the configurable element based in part on the switch control signal.

1 2. The filter of claim 1, wherein the filter circuit comprises an active filter
2 circuit.

1 3. The filter of claim 1, wherein the filter circuit comprises a passive filter
2 circuit.

1 4. The filter of claim 1, wherein the plurality of elements is configured to
2 provide a baseband filter.

1 5. The filter of claim 1, wherein the configurable element comprises two like
2 components of different values and the switch, and wherein the switch is configured to couple
3 one of the two like components to the filter circuit.

1 6. The filter of claim 1, wherein the configurable element comprises two like
2 components of different values, each of the like components selected from the list comprising a
3 resistor, a capacitor, an inductor, and a transconductance element.

1 7. The filter of claim 1, wherein the switch control module generates the
2 switch control signal having a switch control frequency greater than a passband frequency of the
3 filter.

1 8. The filter of claim 1, wherein the switch control module generates the
2 switch control signal having a switch control frequency that lies outside a passband of the filter.

1 9. The filter of claim 1, wherein the switch control module generates a
2 periodic switch control signal.

1 10. The filter of claim 9, wherein the switch control module varies a duty
2 cycle of the periodic switch control signal.

1 11. The filter of claim 1, wherein the switch control module generates a
2 pseudo random switch control signal.

1 12. The filter of claim 1, wherein the filter circuit comprises a lowpass filter,
2 and the switch control module is configured to generate the switch control signal to produce one
3 of a plurality of predetermined frequency responses.

1 13. A reconfigurable filter comprising:
2 a first configuration of elements configured to provide a first filter response;
3 a second configuration of elements configured to provide a second filter response
4 different from the first filter response;
5 at least one switch configured to selectively switch between the first configuration
6 and the second configuration; and
7 a switch control module configured to generate at least one switch control signal
8 comprising a pseudo random sequence to control the position of the at least one switch.

1 14. The reconfigurable filter of claim 13, wherein the switch control module
2 comprises a pseudo random modulator.

1 15. The reconfigurable filter of claim 13, wherein the switch control module
2 comprises a delta-sigma modulator.

1 16. The reconfigurable filter of claim 15, wherein the delta sigma modulator
2 comprises a latch clocked at a rate greater than a passband frequency of the first filter response.

1 17. The reconfigurable filter of claim 15, wherein the delta sigma modulator
2 comprises a latch clocked at a rate that lies outside a passband of the first and second filter
3 responses.

1 18. A reconfigurable filter comprising:
2 a configurable element comprising:
3 a first filter component in series with a first switch; and
4 a second filter component in series with a second switch, the second filter
5 component and second switch connected in parallel with the first filter component and
6 first switch;
7 at least one fixed filter element arranged with the configurable element to produce
8 a filter circuit; and
9 a switch control module configured to generate a pseudo random switch control
10 signal to control the first and second switches to selectively switch between the first and second
11 switch components.

1 19. The reconfigurable filter of claim 18, wherein a value of the configurable
2 element is based at least in part on a fractional allocation of the pseudo random switch control
3 signal to a first signal level.

1 20. A reconfigurable filter comprising:
2 at least one configurable element having a value based in part on a fractional
3 period in which a control signal is at a first signal level; and
4 a filter element coupled to the at least one configurable element to produce a filter
5 circuit.

1 21. A method of configuring a filter response, the method comprising:
2 determining a first filter response corresponding to a first switch configuration of
3 at least one configurable element;
4 determining a second filter response corresponding to a second switch
5 configuration of the at least one configurable element;
6 determining a desired filter response having a frequency response between the
7 first filter response and the second filter response;
8 selectively switching between the first switch configuration and the second switch
9 configuration to produce the desired filter response.

1 22. The method of claim 21, wherein the first filter response comprises a
2 broad filter configuration.

1 23. The method of claim 21, wherein the second filter response comprises a
2 narrow filter configuration.

1 24. The method of claim 21, further comprising:
2 determining a fractional switching time that produces the desired filter response;
3 and
4 selectively switching between the first switch configuration and the second switch
5 configuration using a pseudo random switching signal that controls the switches to the first
6 switch configuration for the fractional switching time.

1 25. An RF integrated circuit having a multimode frequency response, the
2 circuit comprising:

3 an amplifier configured to receive an RF signal;
4 a mixer coupled to the output of the amplifier and configured to frequency
5 convert the RF signal; and
6 a reconfigurable filter coupled to an output of the mixer, the reconfigurable filter
7 comprising:

8 a plurality of elements including a configurable element and configured to
9 provide a filter circuit, the configurable element including at least two filter components
10 and a switch configured to selectively couple one of the at least two filter components to
11 the filter circuit; and

12 a switch control module configured to generate a switch control signal to
13 control the switch in the configurable element to selectively switch between two filter
14 components, a value of the configurable element based in part on the switch control
15 signal.

1 26. A baseband processor integrated circuit having a multimode frequency
2 response, the integrated circuit comprising:

3 a reconfigurable filter comprising:

4 at least one configurable element having a value based in part on a
5 fractional period in which a control signal is at a first signal level; and
6 a filter element coupled to the at least one configurable element to produce
7 a filter circuit;
8 a demodulator coupled to the output of the reconfigurable filter; and
9 a baseband processor coupled to the output of the demodulator and configured to
10 generate a mode select signal that controls, in part, the fractional period in which the control
11 signal is at the first signal level.